# MODIFICATION OF SOME STANDARD APPARATUS TO FACILITATE THE WORK OF THE HISTOLOGIC AND EMBRYOLOGIC LABORATORY

By SIMON HENRY GAGE, Cornell University, Ithaca, N. Y.

WITH ONE PLATE

## (1) AN IMPROVED SECTION RAZOR WITH STRAIGHT BACK AND EDGE

It seems strange that when an instrument takes on new uses it is so slow to lose distinctive features which have no significance or are harmful in the new field. There is thus a certain similarity between a machine in its evolution and an animal or plant. It took a long time to get a section razor with a straight edge for section work, and apparently no one ever thought it necessary to eliminate the compound curves of the back. In the form devised about a year and a half ago the back and edge are both straight, and as nearly as possible parallel. This makes it possible to change the position of the razor in the holder without changing the angle of the cutting edge (pl. XXIII, figs. 1, 2, and 3).

The razor here presented and advocated, then, has edge and back straight and approximately parallel. The razor blade is thick so that it will not readily spring in cutting sections, and it is slightly concaved on both sides to facilitate sharpening. The writer has never yet been able to find out why razors used in histologic work are flat on one side in so many cases.

## (2) A RAZOR HOLDER AND SUPPORT FOR THE MINOT RIBBON MICROTOME

From the cheapness and excellence of razors for sectioning and from the ease of sharpening them, they are used almost exclusively in student work, and also in research work in many laboratories. The Minot ribbon microtome is designed for a section knife of considerable size, and if a razor is placed in the regular holder it can be

moved very little from side to side. This makes it possible to use only a small part of the cutting edge, and the whole razor must be sharpened every time the small part is dull. To avoid the difficulty, a support was devised about two years ago. This consists of a strong piece of brass which rests in the knife support of the microtome. At right angles with the base-piece, on which rests the back of the razor, is a vertical back-piece against which the side of the razor rests. This is slightly narrower than the width of the razor blade, and a notch is cut out of the middle where the sections are made.

A front-piece is made like the back-piece, except that it is not fastened to the base-piece. This is put against the front side of the razor and the clamping screws of the regular knife holder press against it (see figs. 2, 3, 4, and 5).

If one employ such a support with the Minot ribbon microtome, nearly the entire length of the edge of the razor can be used. It is highly advantageous, however, to have a razor with a straight edge and back (see above and fig. 1). Not only should the back be straight, but the haft of the knife should be thin enough so that the angle of the knife will not change in moving the razor.

### (3) AN ADJUSTABLE CLAMP FOR THE MINOT RIBBON MICROTOME

In using the Minot ribbon microtome the holders for the paraffin blocks furnished with the microtome are expensive, and only three come with each microtome. Finally, the clamp to receive these block holders has very slight adjustment, so that the holders must be very accurately fitted. At the Columbus meeting it was pointed out that in a laboratory where many students work and use the microtome there must be many holders for the paraffin blocks. To make this possible with a minimum expense, short stove bolts were recommended. These can be used as they are, or a coin like an American cent can be soldered to the end for a larger attaching surface. From the small adjustment in the clamp for the holder many of the stove bolts could not be used without much trouble in fitting them. To avoid this difficulty an adjustable clamp was devised which will receive bolts differing one or two millimeters in diameter. Two views are shown (figs. 6 and 7). The stem which connects the clamp with the other clamp of the microtome has a long thread and a solid piece is screwed upon it. A loose piece like the first is then slipped over the screw, and finally a thumb nut is put upon the

end to press the loose piece against the fixed piece. Holes are bored in the clamp, half the cylinder being in each. Either of these holes serves for the paraffin block holder. With such a clamp one does not have to worry about the exact size of the stem of the paraffin holder.

(4) AN IMPROVED TRAY FOR HOLDING SLIDES OR RIBBONS OF SECTIONS

The tray exhibited and described at the Columbus meeting proved itself so excellent on extended use that one or two defects have been overcome. The defects were two: First, the outside frame had square corners and sharp edges. The least warping or irregularity made them lock into each other so that it was not easy to pull one out of a pile, nor was it easy to return it to its place again. To avoid this all the corners and edges have been rounded. Slight irregularities do not now interfere with the removal or return of a tray in the middle of a pile.

The second difficulty was in getting hold of a single tray when they were in a pile. This was easily overcome by adding a small screw eye. With the improvements thus indicated one has no longer the necessity of purchasing expensive slide cabinets. These answer every purpose and are exceedingly cheap, costing only about $15 per hundred for trays which will contain fifty 3 x 1 inch trays.

## EXPLANATION OF PLATE

### Plate XXXIV

Details of razor, razor holder, and support for Minot Ribbon Microtome and of adjustable clamp for Paraffin Blocks.